

APPLIED APF RTD[®] AND REPORTER

REAL-TIME DISPATCHING AND REPORTING

A real-time, high performance dispatching and reporting solution that allows manufacturers to identify and implement factory productivity improvements without complex programming.



Industries

- > Semiconductor wafer manufacturing
- > Semiconductor assembly and test
- > Display manufacturing
- > Crystalline silicon (c-Si) solar manufacturing

Features

- > Easy-to-use rule-development environment
- > No coding or complex data modeling required
- > Real-time data interception
- > Ability to easily integrate with multiple data sources within a factory to enable optimal dispatching decisions
- > Ability to combine data from multiple sources and show results in graphical, chart and table-based outputs

Benefits

- > Enables lower cycle-time and less cycle-time variability, leading to improved productivity
- > Improves bottleneck tool performance by ensuring proper feed and by minimizing setups
- > Enhances customer satisfaction by meeting "delivery-to-promise" dates
- > Consistently drives shop floor processing using factory objectives
- > Provides real-time response to production plan updates
- > Increases profitability

Challenges

Frequent, unplanned events in a fab, such as unforeseen inventory, manpower and production problems, can quickly invalidate scheduling plans. Typical scheduling tools are snapshot-based, use stale data and provide only basic reporting and dispatching functionality. Such tools prevent production and planning personnel from reacting in real time and adapting to changes as they occur. Deploying even simple rule scenarios requires large amounts of custom IT development, and homegrown solutions fall short because they are unstable and cannot respond quickly to logic and factory changes.

Solution Description

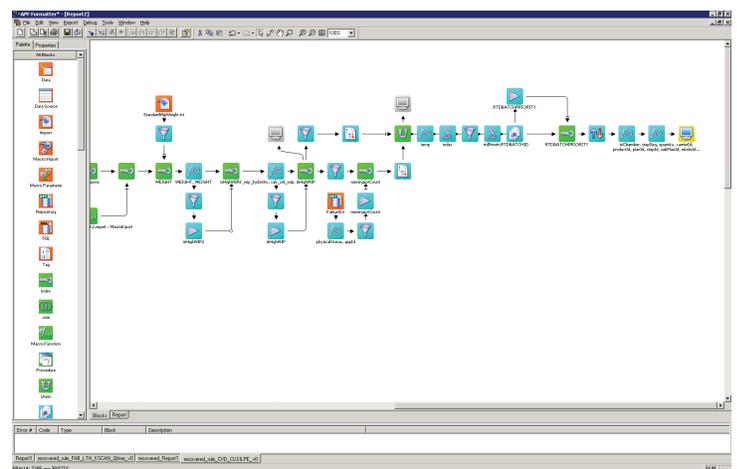
APF Real Time Dispatcher (RTD) and Reporter are the only real-time, high-performance dispatching and reporting solutions that help manufacturers identify and implement process improvements without complex application programming. RTD directs pre-staging, releases lots and adjusts load balancing of production equipment through "what next, where next and when next" rules to improve the use of product, carriers, equipment and labor. A major advantage of RTD is its ability to increase bottleneck throughput by effectively grouping lots of the same characteristics.

As an out-of-the-box solution, RTD and Reporter can be deployed quickly in factories to enhance operations. Manufacturers can easily build their own internal IP to solve complex problems relative to operations. Tight integration capability is provided to key factory data sources with standard offerings for well-known manufacturing execution systems (MES), as well as custom capability for integrating to in-house MES and database systems.

APPLIED MATERIALS EXPERTISE. With a deep knowledge base and a rich history of providing products and solutions specifically addressed to the semiconductor industry, Applied Materials experts provide services to deliver turnkey solutions for enhancing manufacturing value in a timely manner. These solutions are backed by strong development and support teams who are available to ensure continuous product growth, providing customers with low cost of ownership.

RTD uses an icon-based, drag and drop formatter for easily implementing dispatching rules and reports. Formatting tools help you define dispatching rules and report logic to evaluate factory data in the APF repository. No complex programming is required.

APF FORMATTER WINDOW



APPLIED APF RTD[®] AND REPORTER

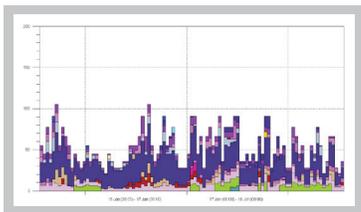
REAL-TIME DISPATCHING AND REPORTING

In a medium sized test facility, what is the potential benefit of increasing tool capacity in bottleneck areas?

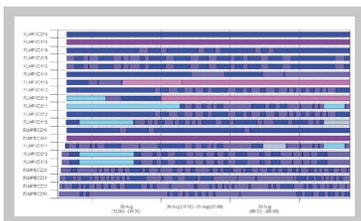
**\$600k
to 1M
Per Factory**

Annual increase in profitability reported by one customer due to higher factory output

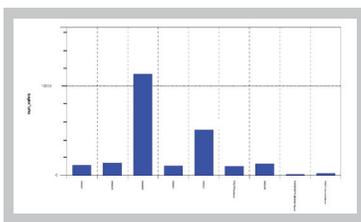
Sample Reports



Stacked temporal report showing the number of active recipes over time.



GANTT chart representing different equipment states over time.



Bar chart indicating the movement of WIP across the flow.

Customer Results

Production planners using RTD can optimize dispatch decisions and improve asset utilization, which drive greater returns on investment and profitability. Fab performance increases, reported publicly by customers using RTD, include:

- > **10%-15%** confirmed increase in wafer output per day
- > **50%** reduction in cycle time and cycle time variability
- > **\$5 million** cost reduction realized in line WIP balancing
- > **10%** increase in tool utilization

RTD and Reporter Capabilities for Achieving Enhanced Factory Performance

✓	Rules-based dispatching	Provides the ability to enhance product workflow in areas with constrained manufacturing resources while ensuring adherence to factory global objectives. Rules are infinitely flexible, can contain multiple criteria and can reference the dynamic state of any entity in a fab.
✓	Real-time reporting	Offers tools for real-time and historical analysis and reporting; provides standard text-based and graphical reports as well as the ability to output in multiple formats (HTML, PDF, XLS, XML and so forth). Reports are automatically executed and distributed according to event- and time-based functionality.
✓	Data integration and storage	Integrates with production, material control and quality applications. APF RTD collects data from multiple sources using extraction technology that intercepts, filters and copies relevant information to a high-speed, temporal repository . This temporal repository provides quick access to historical data for analysis as well as protection against production problems.
✓	Rule formatter	Provides high performance and proven dispatching and reporting functionality with a no-code, easy-to-use rule formatter . Complex code is not required to develop dispatch rules and reports; all APF RTD rules and reports are icon-based.

Package Contents

Designed around best known methods for improving bottleneck capacity and cycle time, the RTD solution offers proven technology in one package that includes:

SOFTWARE

- > Real Time Dispatcher (RTD) module
- > APF Reporter
- > Automation module for automated reporting
- > MES Adapter
- > Formatter for custom rules and report development

SERVICES, TRAINING AND SUPPORT

- > Pre-configured rules for standard global dispatch rules and tester specific rules
- > Dispatch compliance monitoring and reporting
- > On-site deployment, provided by an experienced RTD team
- > One year software maintenance
- > User training